

offer also a considerable variety. The principal mass in the vicinity of London is of a dull bluish or brownish tint, not unlike a clay of the oolitic era. The sub-pennine "marls" are more sandy. Light greenish and bluish marls occur, with prismatic beds of gypsum, at Montmartre, and accompany the limestones of Headon Hill in the Isle of Wight. But the most singular clays are those which accompany the coloured sands of Alum Bay and the neighbourhood of Paris; for these are almost black, or brown, or mottled in the richest manner with red or white, or almost entirely red, so that the same causes of diversity of colour appear to have affected nearly all the deposits of that particular tertiary period.

The tertiary limestones might, perhaps, generally be discriminated from all those of older date by their very inferior degree of induration, though to this certain fresh-water limestones (as near Weimar) offer exceptions. The marine calcaire grossier of Paris is a coarse sandy or chalky limestone; the leithakalk of Austria is a coralline rock, somewhat like the English crag; the fresh-water limestones of Headon Hill are soft, marly, and full of shells; that of Oeningen marly and laminated; near Weimar are very hard and compact beds, which inclose nodules of flint, like some in Cantal, described by Mr. Lyell; a peculiar siliceous limestone occurs in the basin of Paris.

From all these variations of composition, it is evident that the accumulation of tertiary strata is the fruit of a great diversity of causes, or else a great amount of local influences has modified the effects of the general agencies. It is not merely that some are of marine, and others of fluviatile, or of lacustrine origin: these are, indeed, the leading considerations to guide our inquiries, but *local peculiarities of physical geography* are also clearly indicated as important conditions in determining the nature of tertiary strata.

*Structure.—Stratification.*—The whole of the ter-